Effect of Plant-species Richness on Microbial Composition and Rumen Function

1-3. Effect of Plant-species Richness on Microbial Composition and Rumen Function

Miwa NAKANO

[1]Institute of Livestock and Grassland Science, NARO, Japan.

Plant diversity has been known to affect grassland ecosystem productivity and stability (Tilman *et al*. 2006), as well as the mineral balance in grazing cattle (Mizuno *et al*. 2011). However, there is little information on the relationship between plant diversity and livestock productivity traits such as rumen fermentation and digestion. Rumen bacteria play an essential role in the fermentation and digestion of cattle diet. In cattle fed fibrous diets, the rumen bacterial composition is found to be highly diverse (Petri *et al.* 2013), as plant-based fibers are rich in complex polysaccharides that enrich the microbial community (Krause *et al*. 2003). In microbiology, a high diverse microbial community is known to be able to respond quickly and flexibly to environmental changes (Miki 2011). Based on the above information, we proposed the following hypothesis: complex fibrous composition of plants and high fiber intake by cattle in native pastures with high plant diversity lead to high diversity in rumen bacteria, which ensures stable fermentation and digestion, as well as flexibility toward changes in feed. This year, we have investigated the rumen bacterial composition profile and rumen digestibility of grazing cows in two pastures with different plant species counts, by using molecular biology techniques and in vitro incubation, respectively. Stability will be evaluated in terms of changes in bacterial composition and digestibility after a change in the feeding regime from pasture to barn. I believe that understanding the relationship between plant diversity and livestock productivity will provide not only an evaluation of grassland ecosystem capability but also the primary knowledge for maintaining a stable rumen condition for livestock production.